Public Health Investigation in a Military Camp After Diagnosis of Rabies in a Dog—Afghanistan, 2012

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Rabies is one of the risks to which travelers are exposed when going abroad. During the summer of 2012, a rabid dog died in an International Military Transit Camp in Afghanistan, leading to a public health investigation briefly reported here. The lessons learned from this episode are that such investigations are complex and that information for travelers needs to be improved.

Case Report

Rabies is a fatal viral infectious disease due to neurotropic lyssavirus. It can be prevented by preexposure immunization and postexposure prophylaxis (PEP). Rabies represents a public health concern in developing countries with more than 3 billion people at risk in 100 countries throughout the world and 50,000 to 55,000 deaths worldwide each year, mostly due to rabid dog bites in Asia and Africa. Rabies also represents a risk for travelers, especially for long-term travelers and expatriates. According to a recent review, 0.4% (range 0.01%–2.3%) of all international travelers have experienced an at-risk bite per month of stay in a rabies-endemic country. Moreover, 22 confirmed cases of rabies among travelers were reported in the literature over the last decade, and this phenomenon is likely to be underestimated. Military personnel are not spared by rabies because of international missions (usually deployed for more than 3 months), as was demonstrated by the recent death of a US soldier returning from a 1-year deployment in Afghanistan. Over the period 2010–2012, 120 at-risk exposures were reported by French military general practitioners (GPs), representing an overall risk of 0.1% per year in French armed forces (unpublished data). During the summer of 2012, a dog bit several soldiers in a military camp in Afghanistan, and then died of rabies. The aim of this article is to present the public health investigation performed to identify all the subjects exposed to the dog and to implement preventive measures.

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on August 13 by direct immunofluorescence, virus isolation in tissue culture, and rabies antigen detection by immunoenzymatic assay. As the initial infection of the dog could not be documented, the incubation period could not be determined directly, but the French reference center estimated that viral salivary excretion had begun 20 days before the dog’s death. As a precaution, it was decided to extend the “at-risk” period as starting from July 5, 2012 and extending up to August 5, 2012.

Treatment of Cases

Prophylactic treatment of the three soldiers was initiated in Afghanistan according to the current recommendations, depending on the exposure category of each of the soldiers. It consisted of nonspecific treatment (wound cleansing and disinfection), followed by postexposure injection of rabies vaccine to stimulate an active immune response according to the five-dose regimen Essen protocol,3 plus injection with rabies immunoglobulins (RIGs) when necessary.

Thus, among the three soldiers bitten:

• The first presented a deep transdermal bite. He was classified as a category III exposure, received the complete vaccination protocol in Afghanistan (first injection on August 5) and was injected with RIG on August 8 (day 3).

• The other two soldiers presented only superficial skin lesions. They were classified as category II exposures and received the complete vaccination protocol, which began on August 5. The vaccination protocol was completed for one French soldier after his return to France. The other soldier was German, so a German military physician handled his vaccination and follow-up.

Investigation Among the Community

A rapid epidemiological investigation had to be launched in order to identify other soldiers who might have been bitten or dangerously exposed to the dog. It proved difficult because of the international and transit capacity of the camp. An information campaign with pictures of the dog posted throughout the camp was initiated to encourage people to consult a military physician without delay if they had any contact with the animal. Among the 1,000 personnel present in the camp, this campaign enabled the identification of three other subjects exposed (licked on abraded skin), who were also vaccinated with the Essen protocol. Moreover, as many soldiers were in transit during the events, all the soldiers and civilians present in the camp during the incubation period of the rabid dog and before its confinement, regardless of their nationality, were listed and contacted through military GPs in France (if they had returned) or in Afghanistan (if they were still in Afghanistan). The soldiers exposed to the risk of contracting rabies were encouraged to consult the nearest anti-rabies center (n = 412). French military physicians present in Afghanistan informed soldiers from foreign armed forces, but vaccination and follow-up of these personnel were performed by the respective military medical services of their country. We received no information on the results of the investigation on the German side. Four more contacts were identified and treated in France (all of them had been licked on intact skin or had simply petted the dog). The main results of this investigation are shown in Table 1. The CESPA coordinated the investigation and reported to military and civilian authorities, mobilizing eight staff personnel for 5 days during a holiday period to identify the 412 potentially exposed subjects who were personally contacted by their military GP. During the following year, no cases of human rabies and no exposure to rabies related to this episode were reported.

Discussion

This episode serves as a reminder that rabies represents a real risk in Afghanistan, where there is no population control of stray dogs and no vaccination program of domestic animals to our knowledge. Literature on rabies risk in this country is scarce but, according to the World Health Organization, rabies is a major public health concern. Between 2008 and 2012, 144 cases and 5 deaths due to rabies were reported in the country.7 Furthermore, the burden of rabies is very high in Asia in general, with only eight countries free of rabies, and in countries surrounding Afghanistan.8,9 For instance, the incidence of human rabies was estimated at nine cases per million people in Karachi, Pakistan.10 It is thus important that people traveling there, especially service members, receive accurate information on this disease and adopt protective behaviors. In our incident, no human case occurred, but the US armed forces reported

### Table 1  Results of the investigation performed after the death of a rabid dog in a military camp, Afghanistan—August 2012

<table>
<thead>
<tr>
<th>Category of exposure</th>
<th>In-theater (Afghanistan)</th>
<th>Away from theater (France)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1—1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>II</td>
<td>6—4</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>III</td>
<td>5—5</td>
<td>—</td>
<td>10</td>
</tr>
<tr>
<td>Number of soldiers having received PEP</td>
<td>6—4</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Number of soldiers having received postexposure RIG</td>
<td>1—0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

PEP = postexposure prophylaxis; RIG = rabies immunoglobin.

*Among the three soldiers bitten on August 5, two had only superficial skin lesions and no transdermal bites, which corresponds to category II exposures and explains why they did not receive RIG.
Injuries. Thus, improving prevention against this disease among the armed forces requires improving the information delivered to service members, on:

- The importance of not touching animals whether they look aggressive or not, and more generally, of avoiding any direct contact with animals (and not only dogs).
- The importance of not adopting unknown animals. It is an important issue, as military camps are vast and, despite constant surveillance, animals can enter them. Furthermore, mascots represent a centuries-old tradition for military personnel. They are an emblem for military units, which adopt these animals to improve the welfare of their personnel, particularly during deployments.
- The need for immediate wound care and, therefore, for service members to be equipped with the appropriate first aid supplies to wash and disinfect wounds.
- The need to consult a physician rapidly after any animal-related injury in order to assess the risk regarding rabies and the need for PEP with rabies vaccine and/or RIG.

This information must be part of the health protection preparation before and during any deployment in countries where rabies is endemic, especially in Afghanistan.

Regarding rabies vaccine, this episode also raises the question of vaccine availability in the theater of deployment. It is crucial for military physicians in Afghanistan, and in other countries where rabies is endemic, to have access to adequate supplies of vaccines and immunoglobulins. That was apparently not the case for the US soldier who died of rabies. In the French armed forces, medical support is organized in such a way that any military personnel can reach a medical center where rabies risk will be assessed and if necessary PEP will be administered in less than 48 hours. Another question is the relevance of introducing rabies preexposure prophylaxis in the military predeployment vaccination schedule. French military personnel are submitted to a heavy compulsory vaccine schedule that does not systematically include rabies vaccine before deployment, unless they belong to an at-risk group (e.g., dog handlers, veterinary surgeons, or service members deployed in an isolated location). Extending the vaccine recommendations to every service member deployed in a rabies-endemic country could be suggested to simplify the treatment in case of rabies exposure. However, service members usually have easier and faster access to medical care than civilian travelers in similar situations, as they can receive treatment in a military health facility in the field. Thus, as rabies exposure is considered an emergency, soldiers can receive PEP quite rapidly (most often in less than 48 hours) and in proper conditions (e.g., vaccines and RIG appropriately conserved, traceability of injections, and reporting of adverse events). Finally, this strategy should be evaluated regarding cost-benefit and cost-effectiveness aspects. In the future, an option could be the use of intra-dermal vaccine as suggested by several authors.

Another point is the complexity of public health investigations relating to rabid animals when travelers are involved. This complexity may be further increased by time constraints and the possible implication of health services from different countries that will have to work together. In a travel-related context, some questions are more difficult to answer: Who has really been exposed to the dog saliva? How can they be contacted to make sure that they have consulted in clinics that can assess rabies exposure and provide PEP? In our situation, the military administration made it easier for us to obtain the location and telephone number of the service members suspected of having had contact(s) with the dog. However, it remained difficult to reach some of them directly because they were on leave (e.g., visiting family), sometimes far from their primary location, and/or preferred not to have contact with the military during that leave time.

Finally, this investigation illustrates the difficulty of applying PEP prescription recommendations, knowing the high lethality of rabies and the efficacy of PEP, for category I exposures when the diagnosis of rabies is confirmed in the animal. Thus, in our experience, four soldiers were vaccinated after they returned from Afghanistan because they reported having petted the dog, which corresponds to a type I exposure.

Conclusion

Animal-related injuries are not rare among travelers, including deployed military personnel, which exposes them to the risk of rabies and explains that prevention against rabies is still a matter of concern. The need to inform travelers about this risk and the preventive behaviors they should adopt is emphasized here. Finally, the extension of preexposure vaccination against rabies could also be suggested but would need further evaluation.

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Declaration of Interests

The authors state they have no conflicts of interest to declare.
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